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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JAMES HUNTINGTON DABNEY, RICHARD L. QUICK, CONRAD SAWICZ, PAUL LUBOCK, and DAN KUSSMAN

Appeal 2015-003617[1]
Application 11/703,861
Technology Center 3700

Before ANTON W. FETTING, PHILIP J. HOFFMANN, and AMEE A. SHAH, *Administrative Patent Judges*.

SHAH, *Administrative Patent Judge*.

DECISION ON APPEAL[2]

The Appellants[3] appeal under 35 U.S.C. § 134(a) from the Examiner's final decision rejecting claims 79–81 and 84–87. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We note related Appeal 2014-003326, application no. 12/229,764.

[2] Throughout this opinion, we refer to the Appellants' Appeal Brief ("Appeal Br.," filed Aug. 25, 2014), Reply Brief ("Reply Br.," filed Jan. 23, 2015), and Specification ("Spec.," filed Feb. 8, 2007), and to the Examiner's Answer ("Ans.," mailed Dec. 3, 2014) and Final Office Action ("Final Act.," mailed Mar. 31, 2014).

[3] According to the Appellants, the real party in interest is SenoRx, Inc. Appeal Br. 3.

STATEMENT OF THE CASE

The Appellants' "invention is directed to a high frequency electrical power generator particularly suitable for use in electrosurgery." Spec. 4.

Claims 79, 86, and 87 are the independent claims on appeal. Claim 79 is illustrative of the subject matter on appeal, and is reproduced below:

> 79. A method for controlling electrosurgical tissue cutting at a patient's site, comprising:
>
> a. providing an electrosurgical cutting tool having a tissue cutting electrode with a distal tip and an exposed conductive length proximal to the distal tip that is configured to contact tissue;
>
> b. providing a return electrode in contact with the patient's tissue remote from the patient's site;
>
> c. providing an electrosurgical RF power generator in an electrical conductive relationship with the tissue cutting electrode and the return electrode;
>
> d. contacting tissue with the exposed conductive length of the tissue cutting electrode;
>
> e. generating RF energy as a waveform within the electrosurgical RF power generator and gating the RF energy to generate gated RF energy having a duty cycle of less than 100%;
>
> f. delivering the gated RF energy from the electrosurgical RF power generator to the tissue cutting electrode so as to pass an electrical current from the exposed conductive length of the tissue cutting electrode to tissue in contact with the exposed conductive length of the tissue cutting electrode to form a steam layer between the tissue cutting electrode and the tissue by tissue desiccation and generate a conductive plasma along the exposed conductive length, and with the onset of the steam layer continued desiccation and cutting of the tissue is effected; and
>
> g. regulating the electrosurgical RF power generator to maintain a voltage present at the tissue cutting electrode above a level needed to maintain formation of the steam layer by adjusting a gain of a voltage controlled amplifier in the

> electrosurgical RF power generator based at least in part on a voltage present at the electrosurgical cutting tool as well as a DC potential generated across a tool/tissue boundary of the electrosurgical cutting tool and the tissue.

Appeal Br. 36–37 (Claims App.).

REJECTIONS

Claims 79–81, 86, and 87 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindenmeier (US 5,749,869, iss. May 12, 1998), Underwood (US 6,461,350 B1, iss. Oct. 8, 2002), and Estes (US 3,601,126, iss. Aug, 24, 1971). Final Act. 2.

Claims 84 and 85 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lindenmeier, Underwood, Estes, and Eggers (US 6,514,248 B1, iss. Feb. 4, 2003). *Id.* at 8.

ANALYSIS

The Appellants contend that the Examiner's rejection of independent claim 79 is in error because the prior art does not disclose limitations f and g of delivering gated energy to pass an electric current to form a steam layer between the tissue cutting electrode and the tissue by tissue desiccation, and regulating the generator to maintain a voltage present above a level needed to maintain formation of the steam layer by adjusting a gain of voltage based in part on a voltage and a DC potential generated across a tool/tissue boundary. *See* Appeal Br. 17–19. After careful consideration and review of the Examiner's findings and reasoning (*see* Ans. 2–4; Final Act. 2–4), we agree that the Examiner does not show by a preponderance of the evidence that Lindenmeier and Estes, upon which the Examiner relies, discloses

regulating the generator by adjusting a gain of voltage based in past on voltage and a DC potential, as recited in limitation g.

The Examiner finds, in relevant part, that Lindenmeier discloses delivering the gated RF energy to pass a current to form a conductive steam layer, as recited in limitation f, and regulating the electrosurgical RF power generator to maintain a voltage to maintain formation of the steam layer based at least in part on a voltage present, as partially recited in limitation g. Final Act. 3–4; Ans. 2–4. The Examiner acknowledges Lindenmeier does not teach regulating the generator by adjusting a gain of a voltage controlled amplifier, as partially recited in limitation g, and relies on Estes to cure that deficiency. Final Act. 4; Ans. 2. The Examiner determines it would have been obvious to modify Lindenmeier's method of regulating the RF power generator to include Estes's adjusting a gain "in order to regulate the electrosurgical RF power generator using a feedback loop to shift its operational voltage accordingly." Final Act. 4; Ans. 2–3.

We find supported the Examiner's findings that Lindenmeier discloses generating a steam layer, as recited in limitation f, and regulating the generator to maintain a voltage above a level needed to maintain formation of the steam layer, as partially recited in limitation g. Lindenmeier discloses that upon activating a high-frequency generator having an electric value output adjustment device, a transmitter provides a desired value for the generator setting best suited for the initial incision into tissue. Lindenmeier, Abstract, col. 5, ll. 11–21. The best-suited generator setting depends on the impedance condition at the operation site, and the setting may be greater voltage, current, or power. *Id.* at col. 5, ll. 21–26. As soon as the commencement of cutting is determined, the transmitter provides to the

generator a lower desired value, such as voltage, so as to avoid undesired tissue coagulation when making the incision. *Id.* at col. 5, ll. 27–37. A sign of the commencement of cutting is the measured rise in impedance between the probe and tissue, "especially marked when cutting tissue in the stomach and intestines" where the highly conductive fluid and mucous surface layer must be vaporized, resulting in a vapor layer (i.e., a steam layer), before cutting the tissue layers underneath. *Id.* at col. 5, ll. 62–col. 6, ll. 1, 37–38. Before cutting, the tissue impedance is low because of the conductive fluid. *Id.* at col. 11, ll. 2–3. After the vaporization of the layer, the impedance rises, after which an incision can be made. *Id.* at col. 11, ll. 3–6. To reduce delay prior to the initial incision, the generator output power should be as high as possible at the start of the incision, and thereafter "lowered to a value usually sufficient for cutting." *Id.* at col. 11, ll. 6–14.

However, the Examiner has not adequately explained how the prior art discloses regulating the generator by adjusting a gain of an amplifier based at least in part on voltage and a DC potential generated across a tool/tissue boundary, as recited in limitation g. The Examiner cites to Lindenmeier at column 6, lines 54–65 and finds that Lindenmeier's use of a characteristic spectral distribution of power based on spectral evaluation measuring the asymmetry of current flow that sets in at different times depending on polarity "demonstrates that DC potential, a polarity, is present in order for the cutting procedure of Lindenmeier to work as intended." Ans. 3. The Examiner further finds that Lindenmeier discloses, at column 6, lines 26–32,

> having "an indicator device which compares the spectrum of the power at the output of the generator influenced by the electric arc or a value dependent on it such as current or voltage in at least

> two different frequency ranges. A desired value that influences the generator power is transmitted according to the results of this comparison."

Id. at 4. But this teaches that the regulating of the generator can be based on current **or** voltage. It is further not clear whether Lindenmeier's current is alternating, i.e., AC, or constant, i.e., DC. *See* Appeal Br. 22. We do not see, and the Examiner has not adequately explained, where or how Lindenmeier discloses regulating the generator to maintain a voltage based at least in part on a voltage present **and** ("as well as") a DC current or polarity ("a DC potential generated across a tool/tissue boundary"). The Examiner has also not adequately explained how Estes's regulating of a generator by adjusting a gain of a voltage controlled amplifier is based at least in part on the voltage and DC potential. And, the Examiner has not adequately explained how the combination of Lindenmeier and Estes teaches regulating the generator by adjusting a gain of a voltage controlled amplifier in the generator based at least in part on a voltage present and the DC potential generated.

Thus, we are persuaded of error on the part of the Examiner, and we do not sustain the Examiner's rejection of independent claim 79 and dependent claims 80 and 81. We also do not sustain the rejection of claims 84 and 85, each of which ultimately depends from independent claim 79. *Cf. In re Fritch*, 972 F.2d. 1260, 1266 (Fed. Cir. 1992) ("dependent claims are nonobvious if the independent claims from which they depend are nonobvious").

Each of the independent claims 86 and 87 recites limitations substantially similar to limitations f and g of claim 79 (Appeal Br. 37–39 (Claims App.)), and the Examiner relies on the same findings (*see* Final

Act. 5–8). Thus, for the same reasons we do not sustain the rejection of claim 79, we also do not sustain the rejection of claims 86 and 87.

DECISION

The Examiner's decision to reject of claims 79–81 and 84–87 under 35 U.S.C. § 103(a) is REVERSED.

REVERSED